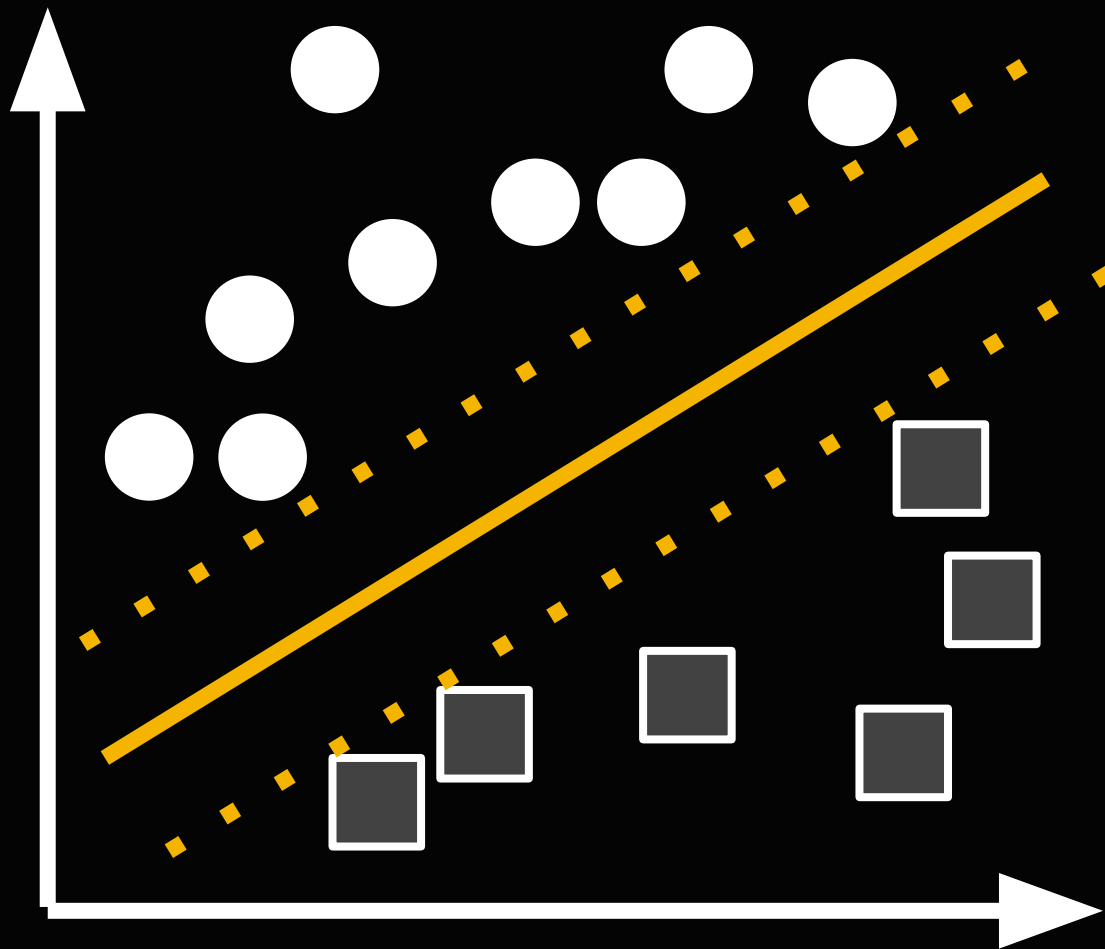
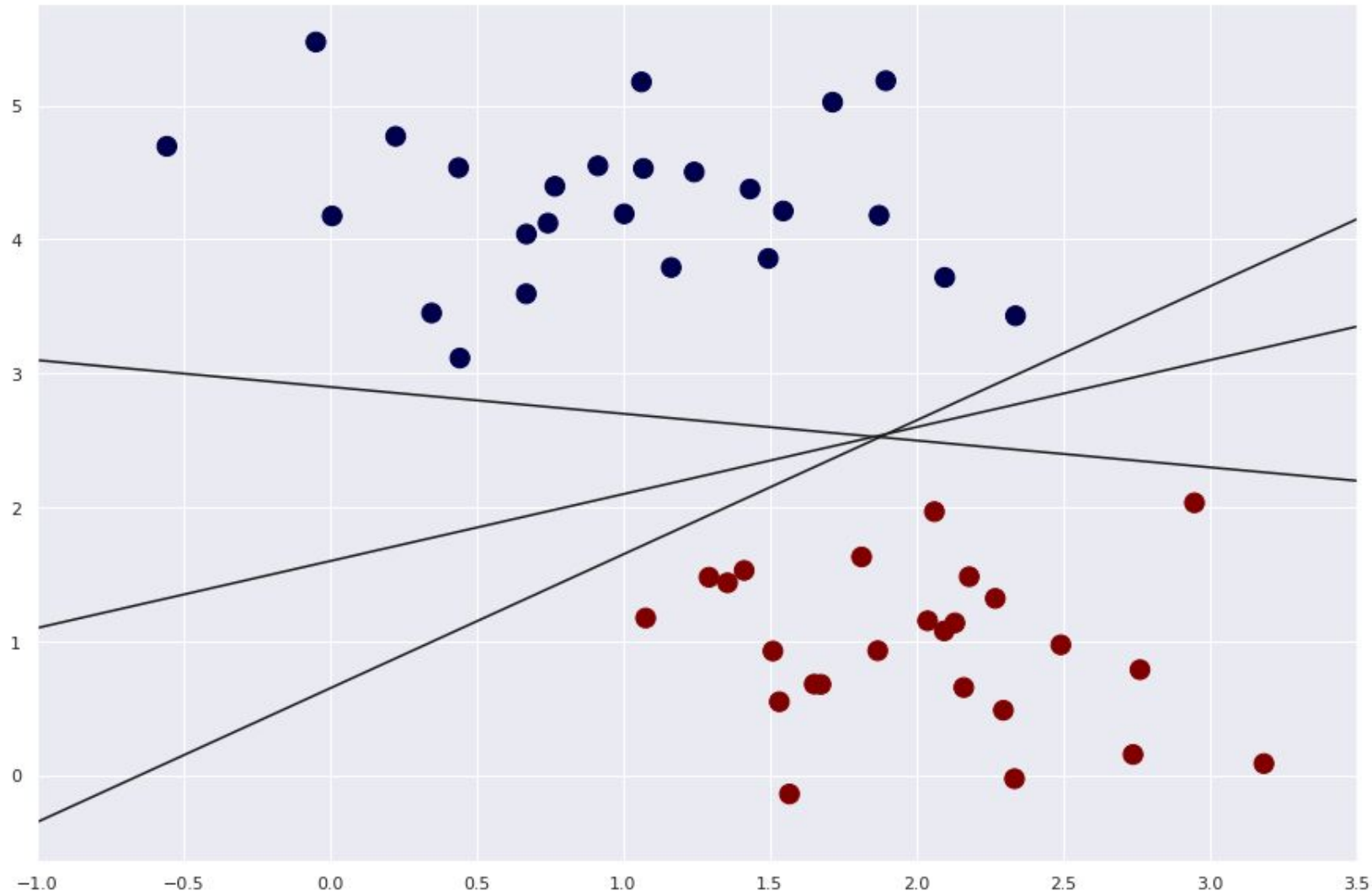
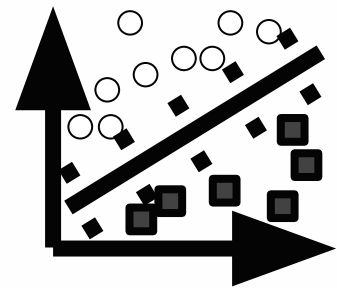


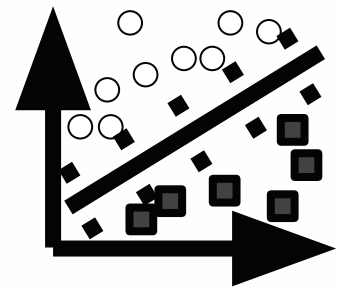
How SVM
works



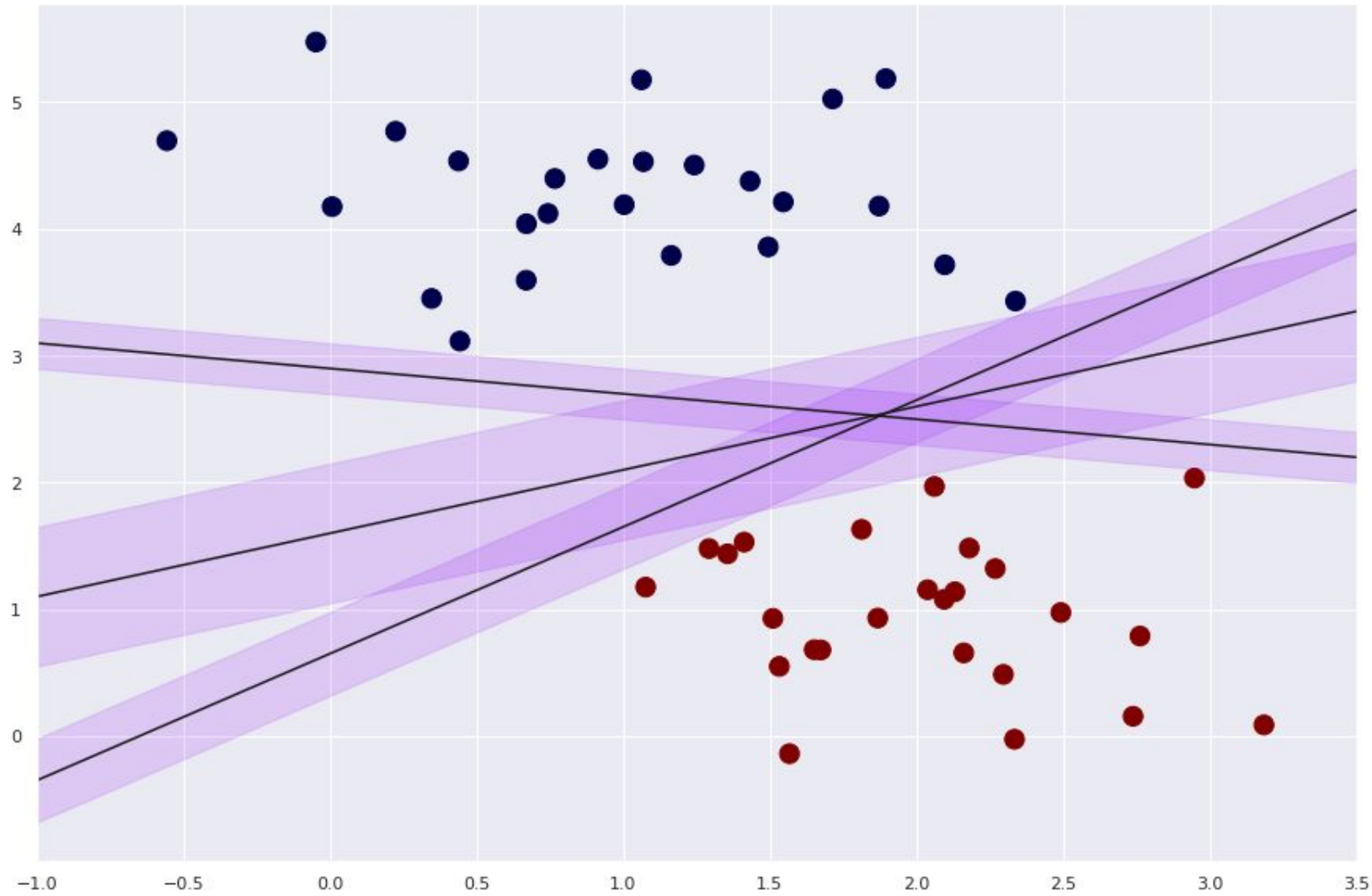




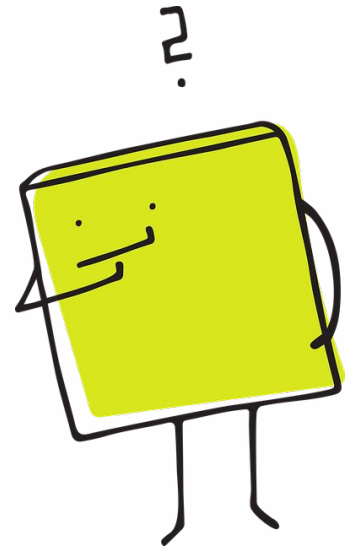
How can SVM find the best line?

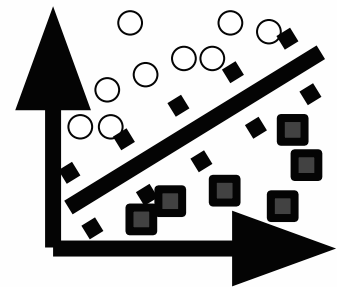


Draw a margin around each line



Which is the best line?

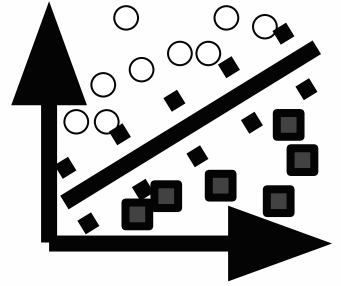


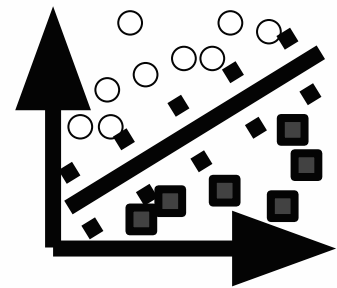


SVM

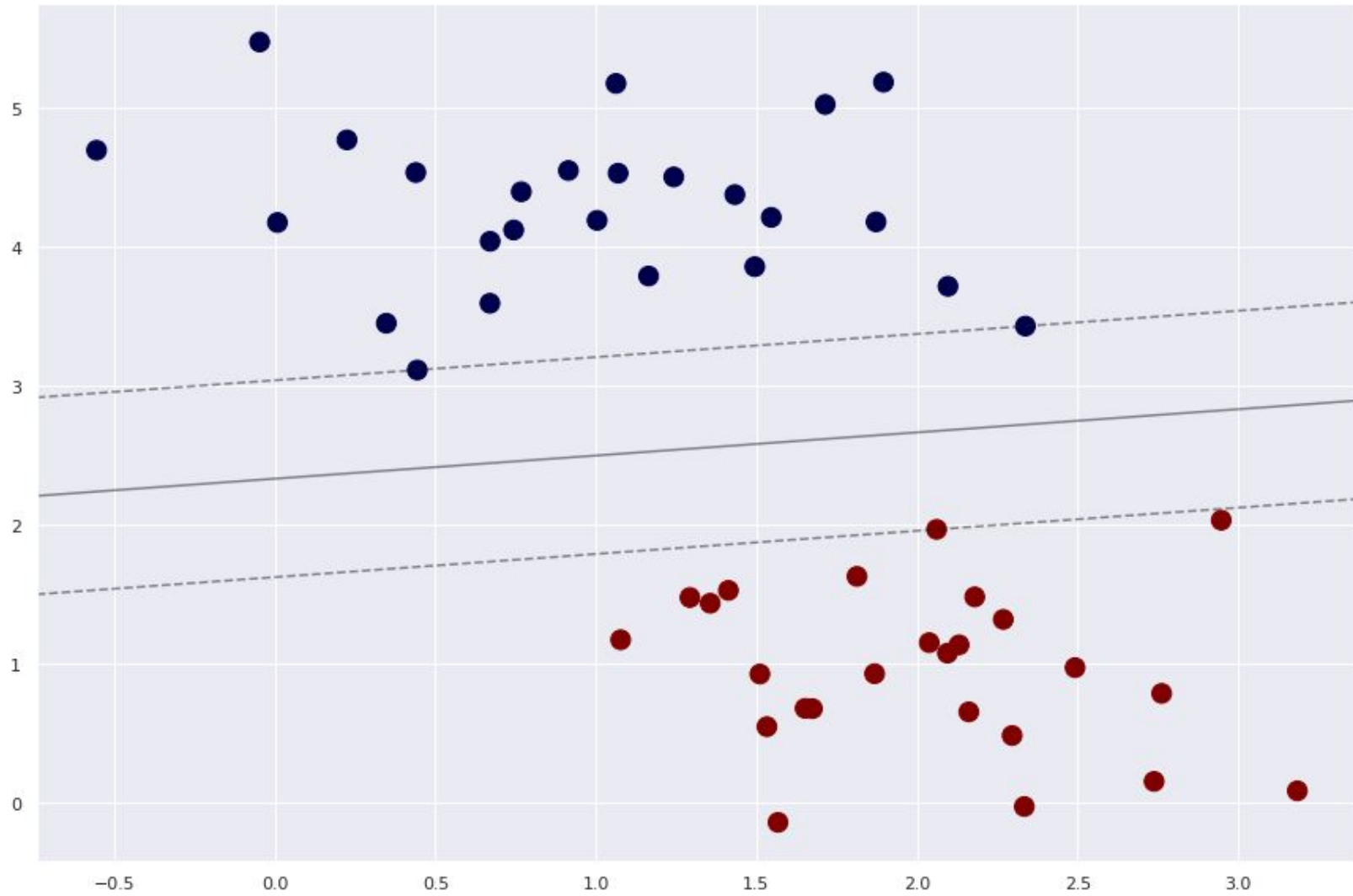
- Line that **maximizes margin** is optimal
- **Maximum margin estimator**

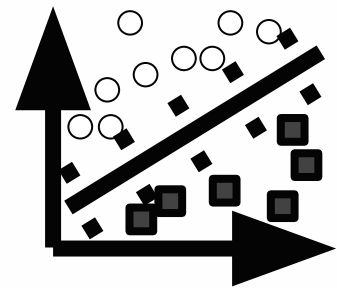
Finds a plane with the **maximum**
distance between data points of
classes





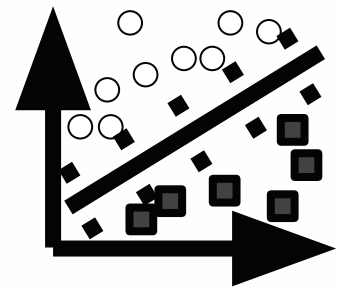
Create the **best decision boundary** that can
separate 2 or more classes (with maximum
margin)





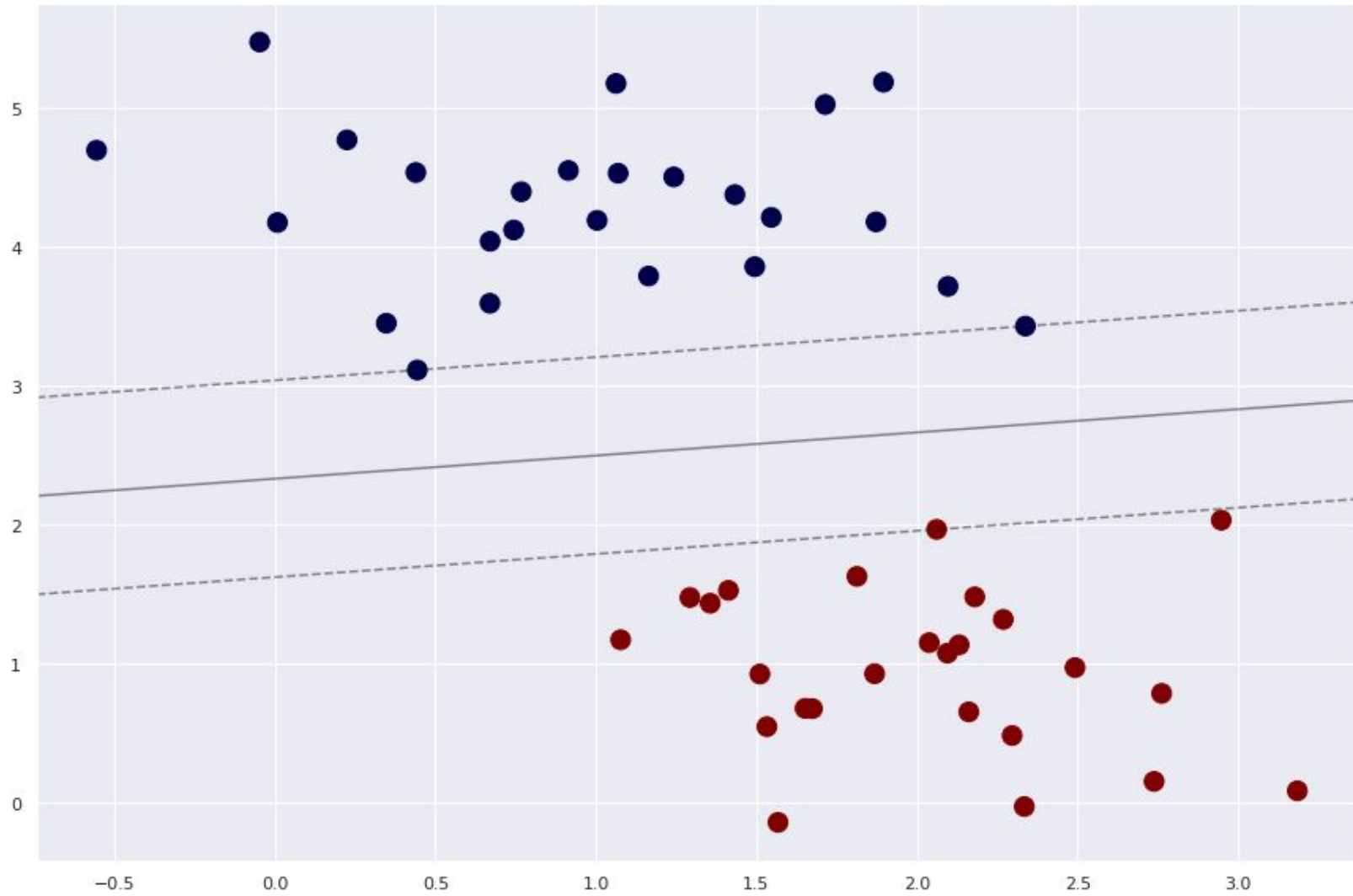
Goal

- Put **new** data points in their correct class.



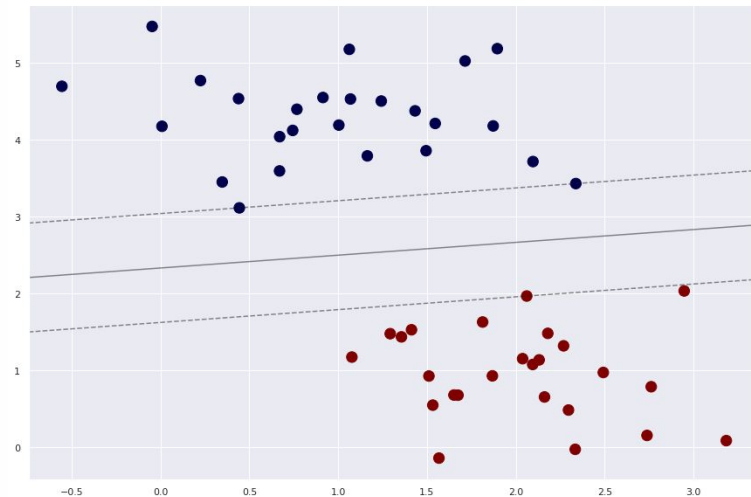
When to use?

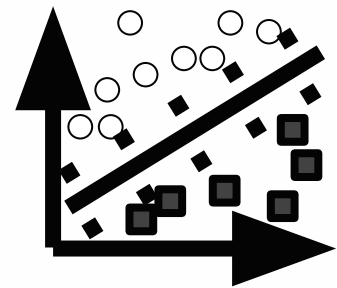
- Best for **relatively small datasets**
 - Fewer outliers
- Other models need more data but create robust models.



Some training points **touch**
the plane margin

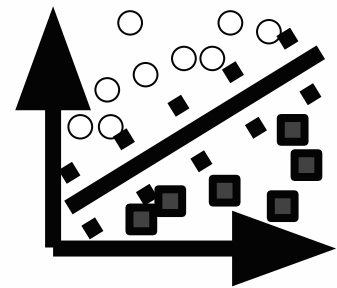
- Pivotal elements of this fit
- Support vectors





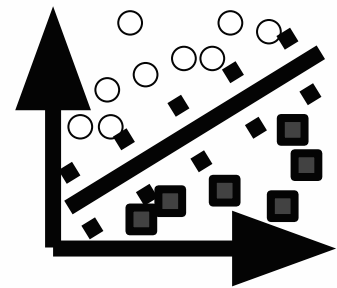
What is a **support vector**?

- Data points nearest to the hyperplane
- if removed, would change the position of the dividing hyperplane.
- critical elements of a dataset



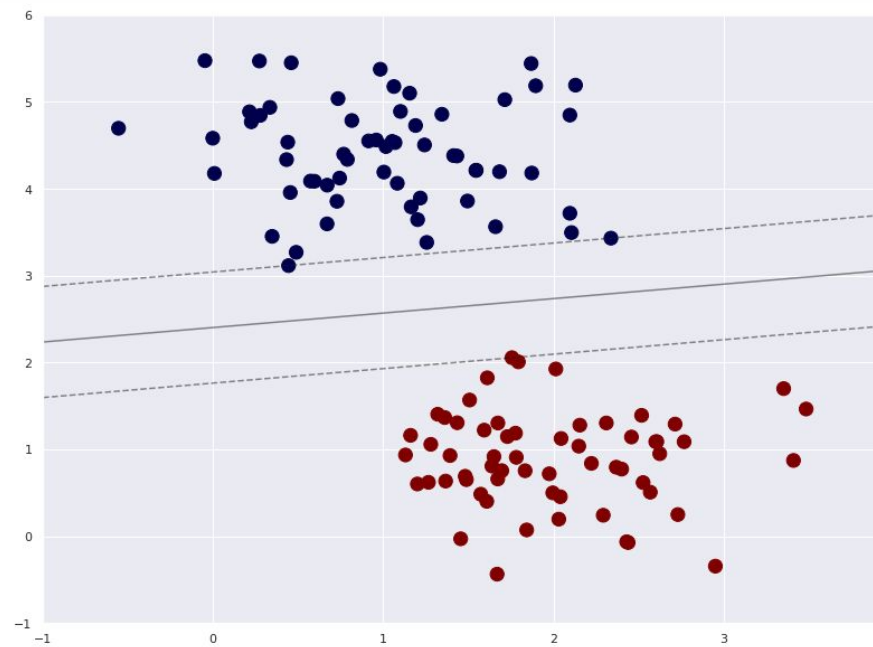
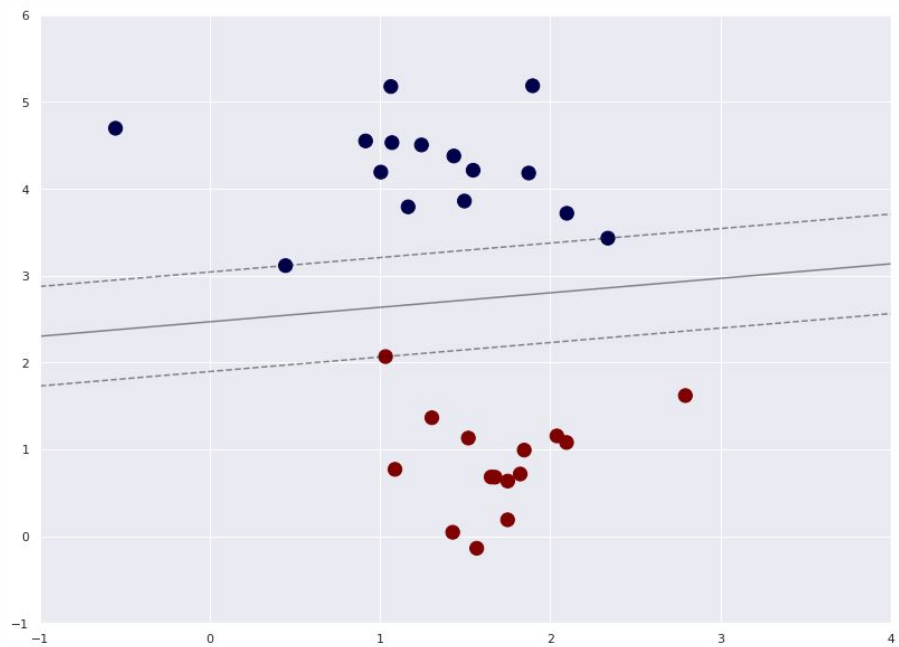
“SVM”?

- chooses **extreme vectors** or **support vectors** to create the hyperplane



Note

- **only the position of the support vectors matter** for the fit
- any points further from the margin which are on the correct side **do not change the fit**
- these points **do not contribute to the loss function**



How SVM
works ✓

